

REMARKS

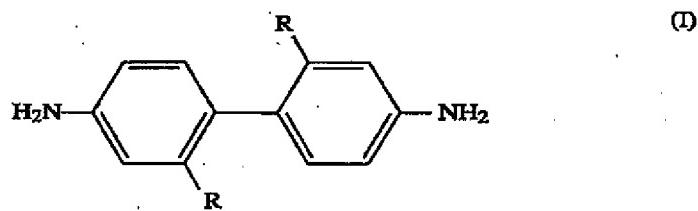
This is in response to the Office Action of July 31, 2008. All of the claims in this application are limited to specify that Applicants' polyamic acids and polyimides have *only* the compositional components specified in the respective claims. This amendment is based upon such disclosure as that in the paragraph bridging pages 11-12 of the specification. No new matter or additional subject matter is introduced into the application by this Amendment. Claims 1-8, all of which are effectively amended by the above changes to the claims, are pending in the application.

Obviousness

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over US 5,478,918 (Maruta). Office Action, pages 3-5. The rejection is respectfully traversed.

NO *PRIMA FACIE* OBVIOUSNESS

Maruta fails to show polyamic acid structural formulas such as Applicants' formula (1) and polyimide structural formulas such as Applicants' formula (3). However, it appears that Maruta generically teaches reacting tetracarboxylic acid and diamine precursor compounds to form polyamic acids and polyimides falling within Applicants' formulas. More specifically, Maruta teaches the following benzidine monomer of formula (I):



wherein R are the same or different ones selected from the group consisting of  $\text{CF}_3$ ,  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ ,  $\text{OCH}_3$ ,  $\text{OC}_2\text{H}_5$ , Cl, Br and phenyl group.

There is no overlap between Applicants' compounds and those of Maruta. In any case, in addition to the tetracarboxylic acid component and the diamine component which appear to be relevant to Applicants' invention, *Maruta's compositions must also include a maleimide compound and a siloxydiamine compound.* Applicants teach, in the paragraph bridging pages 11-12 of their specification, that their compositions preferably have *only* the components specified in Applicants' formulas (1)-(4). This exclusionary feature is now recited in Applicants' claims in order to distinguish further over the Maruta compositions which *must* include the specified additional materials.

#### UNEXPECTED BENEFICIAL PROPERTIES

To the extent that the Maruta disclosure raises a *prima facie* case of obviousness with respect to the present invention – which Applicants do not concede – any such *prima facie* case of obviousness is overcome by unexpected beneficial properties provided by the present invention.

On pages 5-6 of the Office Action, the Examiner addresses Applicants' previous discussion with respect to unexpected beneficial properties. Polyimides herein are synthesized from diamines and acid dianhydrides. In Examples 5-8, the diamine is m-NPOB (2,2'-di-n-propyloxybenzidine) and a variety of acid dianhydrides is used. In Examples 9-14, the diamine is m-PHOB (2,2'-diphenyloxybenzidine) and a variety of acid dianhydrides is used. When comparing Examples 1-4 or Comparative Examples 1-3 with Examples 5-8 or Examples 9-14, in order to judge the effect of the diamine, it is necessary to compare compounds made with the same acid dianhydride, in order to eliminate the influence on the comparison of the type of acid dianhydride. The following example groupings eliminate the effect of the acid dianhydride component:

- (A) Example 1, Example 5, Example 10, Comparative Example 1;
- (B) Example 2, Example 6, Example 11, Comparative Example 3;
- (C) Example 3, Example 7, Example 12, Comparative Example 2.

In group A, Example 5 and Example 10 have significantly lower numeric values of

coefficient of moisture absorption (CMA) and coefficient of humidity expansion (CHE) than do Example 1 and Comparative Example 1. In group B, Example 6 and Example 11 have significantly lower numeric values of coefficient of moisture absorption (CMA) and coefficient of humidity expansion (CHE) than do Example 2 and Comparative Example 3. In group C, Example 7 and Example 12 have significantly lower numeric values of coefficient of moisture absorption (CMA) and coefficient of humidity expansion (CHE) than do Example 3 and Comparative Example 2.

As pointed out by the Examiner, the coefficient of linear expansion values across the inventive and comparative compositions do not vary greatly. Therefore, unexpectedly, the polyimides of the present invention successfully reduce the numeric values of CMA and CHE while not affecting the value of CTE.

The Maruta polyimides are disclosed to be particularly suitable for wet etching processing. Surprisingly, Applicants' polyimides are quite stable from the point of view of their chemistry, and Applicants' polyimides are unsuited for wet etching processing. That is to say, the polyimide of the present invention – unlike the reference polyimides – have surprisingly been found to excel in terms of stability and to have excellent solvent resistance.

Nothing in the Maruta reference teaches or suggests these unexpected beneficial aspects of the presently claimed invention. Accordingly, the obviousness rejection should be withdrawn.

Contact information

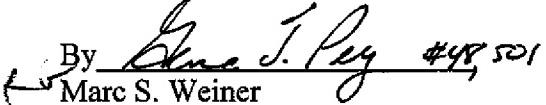
If there are any questions concerning this application, the Examiner is invited to contact Richard Gallagher, Registration No. 28,781, at (703) 205-8008.

No fee is believed to be necessary in connection with this response. If any fee is determined to be necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448

for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

Dated: October 31, 2008

Respectfully submitted,

By   
Marc S. Weiner

Registration No.: 32,181  
BIRCH, STEWART, KOLASCH & BIRCH, LLP  
8110 Gatehouse Road  
Suite 100 East  
Falls Church, Virginia 22040-0747  
(703) 205-8000  
Attorney for Applicant